

### AMENDMENTS TO THE CLAIMS

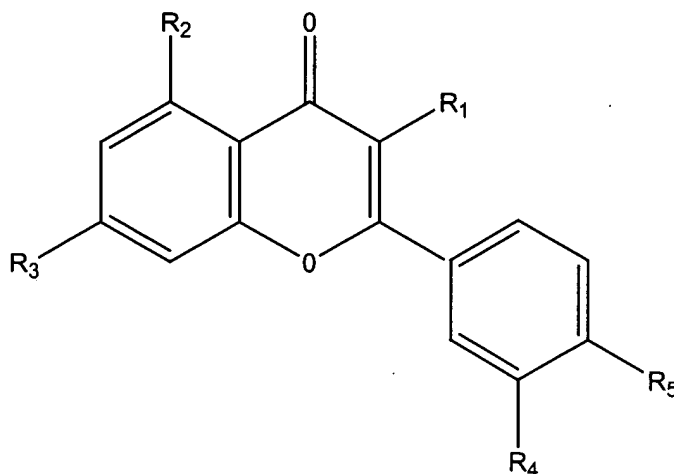
This listing of claims will replace all prior versions and listings of claims in the application.

#### LISTING OF CLAIMS

##### **Claims 1-15 (Cancelled)**

**Claim 16 (New)** A method of ameliorating the symptoms associated with osteoporosis, said method comprising:

administering to said subject a therapeutic agent comprising quercetin or at least one derivative thereof represented by the following general formula (I)



wherein

R<sub>1</sub> is gentiotriose, glucopyranose, O-arabinofuranose, O-diglucopyranose, O-galactopyranose, O-galactoside-gallate, O-gentiobiose, O-glucopyranose, O-glucuronide, O-neohesperidose, O-rhamnopyranose, O-sophorose, O-xylopyranose, OCH<sub>3</sub>, OH, rhamnogentiobiose, rhamnoglucofucose, or sulfate;

R<sub>2</sub> is OH or O-glucopyranose;

R<sub>3</sub> is OCH<sub>3</sub>, OH, O-glucopyranose, O-glucuronopyranose or glucopyranose;

R<sub>4</sub> is OCH<sub>3</sub>, OH; and

R<sub>5</sub> is OCH<sub>3</sub>, OH, O-glucopyranose or O-glucose, and

wherein said therapeutic agent lacks calcium.

**Claim 17 (New)** The method of Claim 16, wherein said quercetin or at least one derivative thereof is selected from the group consisting of quercetin, avicularoside, guiajaverin, hyperoside, isohyperoside, isoquercitrin, multinoside A, multinoside A acetate, quercitrin, quercetin-3-O-(2''-O-β-D-glucopyranosyl)-α-L-rhamnopyranoside, quercetin-3-O-(6''-O-galloyl)-glucopyranoside, quercetin-3-O-(6'''-O-p-coumaroyl-β-D-glucopyranosyl-(1-2)-α-L-rhamnopyranoside), quercetin-3-O-D-glucopyranosyl-(1-6)-β-D-glucopyranosyl-(1-4)-α-L-rhamnopyranoside, quercetin-3-O-[2''-O-6'''-O-p-(7'''-O-β-D-glucopyranosyl)coumaroyl-β-D-glucopyranosyl]-α-L-rhamnopyranoside, quercetin-3-O-[6'''-p-coumaroyl-β-D-glucopyranosyl-β-(1-4)-rhamnopyranoside], quercetin-3-O-[α-L-rhamnopyranosyl (1-2)-α-L-rhamnopyranosyl-(1-6)-β-D-glucopyranoside], quercetin-3-O-[α-rhamnopyranosyl (1-4)α-L-rhamnopyranosyl (1-6)β-D-galactopyranoside], quercetin-3-O-[α-rhamnopyranosyl-(1-2)]-[β-glucopyranosyl-(1-6)]-β-D-galactopyranoside, quercetin-3-O-[α-rhamnopyranosyl-(1-4)-α-rhamnopyranosyl-(1-6)-β-galactopyranoside], quercetin-3-O-α-L-rhamnopyranosyl-(1-2)-β-D-galactopyranoside, quercetin-3-O-β-D-diglucopyranoside, quercetin-3-O-β-D-galactoside-2''-gallate, quercetin-3-O-β-D-glucopyranoside-(1-6)-β-D-galactopyranoside, quercetin-3-O-β-D-glucopyranosyl-(1-3)-α-L-rhamnopyranosyl-(1-6)-β-D-galactopyranoside, quercetin-3-O-β-D-glucuronide, quercetin-3-O-β-D-xylopyranoside, quercetin-3-O-diglucospyranoside, quercetin-3-O-gentiobioside, quercetin-3-O-glucopyranosylgalactopyranoside, quercetin-3-O-neohesperidoside, quercetin-3-gentiotrioside, quercetin-3-methyl ether, quercetin-3-rhamnogentiobioside, quercetin-3-rhamnoglucoside and quercetin-3-sulfate.

**Claim 18 (New)** The method of Claim 16, wherein said at least one quercetin derivative is selected from the group consisting of isorhamnetin, quercimeritrin, rhamnetin, quercetin-5-O-β-D-glucopyranoside, quercetin-7-O-β-D-glucuronopyranoside and spireaoside.

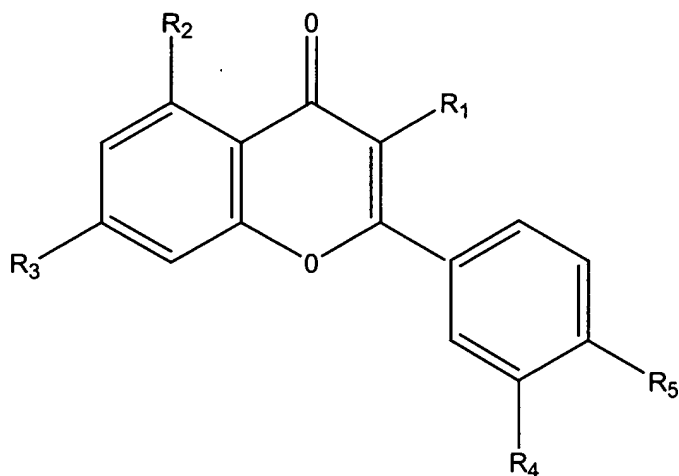
**Claim 19 (New)** The method of Claim 16, wherein said at least one quercetin derivative is selected from the group consisting of rhamnazin, quercetin-3',4'-di-methyl ether, quercetin-3,3'-dimethyl ether, quercetin-3,7-dimethyl ether, quercetin-3-O-[2''-O-(6'''-O-p-coumaroyl)-β-D-glucopyranosyl]-α-L-rhamnopyranosyl-7-O-β-D-glucopyranoside, quercetin-3-O-[2''-O-6'''-O-p-(7'''-O-β-D-glucopyranosyl)coumaroyl-β-D-glucopyranosyl]-α-L-rhamnopyranoside-7-O-β-D-glucopyranoside, quercetin-3-O-rutinoside-7-O-β-D-glucopyranoside, quercetin-3-O-α-L-arabinopyranosyl-7-O-β-D-glucopyranoside, quercetin-7-O-β-D-glucopyranoside-3-O-sophoroside, quercetin-3-O-galactopyranosyl-7-O-diglucopyranoside,

quercetin-3-O-glucopyranosyl-7-diglucopyranoside, quercetin-3,7-diglucopyranoside, quercetin-3-gentiobiosyl-7-glucopyranoside and quercetin-3,4'-di-O- $\beta$ -D-glucopyranoside.

**Claim 20 (New)** The method of Claim 16, wherein said at least one quercetin derivative is selected from the group consisting of quercetin-3,4',7-trimethyl ether and quercetin-3,3',4',7-tetramethyl ether.

**Claim 21 (New)** A method of ameliorating the symptoms associated with osteoporosis, said method comprising:

administering to said subject a therapeutic agent consisting essentially of quercetin or at least one derivative thereof represented by the following general formula (I)



wherein

R<sub>1</sub> is gentiotriose, glucopyranose, O-arabinofuranose, O-diglucopyranose, O-galactopyranose, O-galactoside-gallate, O-gentiobiose, O-glucopyranose, O-glucuronide, O-neohesperidose, O-rhamnopyranose, O-sophorose, O-xylopyranose, OCH<sub>3</sub>, OH, rhamnogentiobiose, rhamnoglucofucose, or sulfate;

R<sub>2</sub> is OH or O-glucopyranose;

R<sub>3</sub> is OCH<sub>3</sub>, OH, O-glucopyranose, O-glucuronopyranose or glucopyranose;

R<sub>4</sub> is OCH<sub>3</sub>, OH; and

R<sub>5</sub> is OCH<sub>3</sub>, OH, O-glucopyranose or O-glucose.

**Claim 22 (New)** The method of Claim 21, wherein said quercetin or at least one derivative thereof is selected from the group consisting of quercetin, avicularoside, guaijaverin, hyperoside, isohyperoside, isoquercitrin, multinoside A, multinoside A acetate, quercitrin, quercetin-3-O-(2''-O- $\beta$ -D-glucopyranosyl)- $\alpha$ -L-rhamnopyranoside, quercetin-3-O-(6''-O-galloyl)-glucopyranoside, quercetin-3-O-(6'''-O-p-coumaroyl- $\beta$ -D-glucopyranosyl-(1-2)- $\alpha$ -L-rhamnopyranoside), quercetin-3-O-D-glucopyranosyl-(1-6)- $\beta$ -D-glucopyranosyl-(1-4)- $\alpha$ -L-rhamnopyranoside, quercetin-3-O-[2''-O-6'''-O-p-(7'''-O- $\beta$ -D-glucopyranosyl)coumaroyl- $\beta$ -D-glucopyranosyl]- $\alpha$ -L-rhamnopyranoside, quercetin-3-O-[6'''-p-coumaroyl- $\beta$ -D-glucopyranosyl- $\beta$ -(1-4)-rhamnopyranoside], quercetin-3-O-[ $\alpha$ -L-rhamnopyranosyl (1-2)- $\alpha$ -L-rhamnopyranosyl-(1-6)- $\beta$ -D-glucopyranoside], quercetin-3-O-[ $\alpha$ -rhamnopyranosyl (1-4) $\alpha$ -L-rhamnopyranosyl (1-6) $\beta$ -D-galactopyranoside], quercetin-3-O-[ $\alpha$ -rhamnopyranosyl-(1-2)]-[ $\beta$ -glucopyranosyl-(1-6)]- $\beta$ -D-galactopyranoside, quercetin-3-O-[ $\alpha$ -rhamnopyranosyl-(1-4)- $\alpha$ -rhamnopyranosyl-(1-6)- $\beta$ -galactopyranoside], quercetin-3-O- $\alpha$ -L-rhamnopyranosyl-(1-2)- $\beta$ -D-galactopyranoside, quercetin-3-O- $\beta$ -D-diglucopyranoside, quercetin-3-O- $\beta$ -D-galactoside-2''-gallate, quercetin-3-O- $\beta$ -D-glucopyranoside-(1-6)- $\beta$ -D-galactopyranoside, quercetin-3-O- $\beta$ -D-glucopyranosyl-(1-3)- $\alpha$ -L-rhamnopyranosyl-(1-6)- $\beta$ -D-galactopyranoside, quercetin-3-O- $\beta$ -D-glucuronide, quercetin-3-O- $\beta$ -D-xylopyranoside, quercetin-3-O-diglucospyranoside, quercetin-3-O-gentiobioside, quercetin-3-O-glucopyranosylgalactopyranoside, quercetin-3-O-neohesperidoside, quercetin-3-gentiotrioside, quercetin-3-methyl ether, quercetin-3-rhamnogentiobioside, quercetin-3-rhamnoglucoside and quercetin-3-sulfate.

**Claim 23 (New)** The method of Claim 21, wherein said at least one quercetin derivative is selected from the group consisting of isorhamnetin, quercimeritrin, rhamnetin, quercetin-5-O- $\beta$ -D-glucopyranoside, quercetin-7-O- $\beta$ -D-glucuronopyranoside and spireaoside.

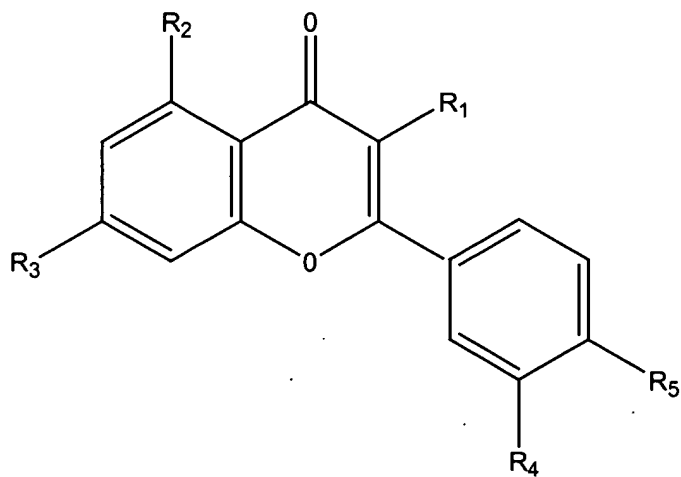
**Claim 24 (New)** The method of Claim 21, wherein said at least one quercetin derivative is selected from the group consisting of rhamnazin, quercetin-3',4'-di-methyl ether, quercetin-3,3'-dimethyl ether, quercetin-3,7-dimethyl ether, quercetin-3-O-[2''-O-(6'''-O-p-coumaroyl)- $\beta$ -D-glucopyranosyl]- $\alpha$ -L-rhamnopyranosyl-7-O- $\beta$ -D-glucopyranoside, quercetin-3-O-[2''-O-6'''-O-p-(7'''-O- $\beta$ -D-glucopyranosyl)coumaroyl- $\beta$ -D-glucopyranosyl]- $\alpha$ -L-rhamnopyranoside-7-O- $\beta$ -D-glucopyranoside, quercetin-3-O-rutinoside-7-O- $\beta$ -D-glucopyranoside, quercetin-3-O- $\alpha$ -L-arabinopyranosyl-7-O- $\beta$ -D-glucopyranoside, quercetin-7-O- $\beta$ -D-glucopyranoside-3-O-sophoroside, quercetin-3-O-galactopyranosyl-7-O-diglucopyranoside,

quercetin-3-O-glucopyranosyl-7-diglucopyranoside, quercetin-3,7-diglucopyranoside, quercetin-3-gentiobiosyl-7-glucopyranoside and quercetin-3,4'-di-O- $\beta$ -D-glucopyranoside.

**Claim 25 (New)** The method of Claim 21, wherein said at least one quercetin derivative is selected from the group consisting of quercetin-3,4',7-trimethyl ether and quercetin-3,3',4',7-tetramethyl ether.

**Claim 26 (New)** A method of ameliorating the symptoms associated with osteoporosis, said method comprising:

increasing the trabecular bone area of a subject by administering to said subject a therapeutic agent, which comprises quercetin or at least one derivative thereof represented by the following general formula (I)



wherein

R<sub>1</sub> is gentiotriose, glucopyranose, O-arabinofuranose, O-diglucopyranose, O-galactopyranose, O-galactoside-gallate, O-gentiobiose, O-glucopyranose, O-glucuronide, O-neohesperidose, O-rhamnopyranose, O-sophorose, O-xylopyranose, OCH<sub>3</sub>, OH, rhamnogentiobiose, rhamnoglucose, or sulfate;

R<sub>2</sub> is OH or O-glucopyranose;

R<sub>3</sub> is OCH<sub>3</sub>, OH, O-glucopyranose, O-glucuronopyranose or glucopyranose;

R<sub>4</sub> is OCH<sub>3</sub>, OH; and

R<sub>5</sub> is OCH<sub>3</sub>, OH, O-glucopyranose or O-glucose, and

wherein said increase in trabecular bone area is at least about 29 percent.

**Claim 27 (New)** The method of Claim 26, wherein said quercetin or at least one derivative thereof is selected from the group consisting of quercetin, avicularoside, guaijaverin, hyperoside, isohyperoside, isoquercitrin, multinoside A, multinoside A acetate, quercitrin, quercetin-3-O-(2''-O-β-D-glucopyranosyl)-α-L-rhamnopyranoside, quercetin-3-O-(6''-O-galloyl)-glucopyranoside, quercetin-3-O-(6'''-O-p-coumaroyl-β-D-glucopyranosyl-(1-2)-α-L-rhamnopyranoside), quercetin-3-O-D-glucopyranosyl-(1-6)-β-D-glucopyranosyl-(1-4)-α-L-rhamnopyranoside, quercetin-3-O-[2''-O-6'''-O-p-(7'''-O-β-D-glucopyranosyl)coumaroyl-β-D-glucopyranosyl]-α-L-rhamnopyranoside, quercetin-3-O-[6'''-p-coumaroyl-β-D-glucopyranosyl-β-(1-4)-rhamnopyranoside], quercetin-3-O-[α-L-rhamnopyranosyl (1-2)-α-L-rhamnopyranosyl-(1-6)-β-D-glucopyranoside], quercetin-3-O-[α-rhamnopyranosyl (1-4)α-L-rhamnopyranosyl (1-6)β-D-galactopyranoside], quercetin-3-O-[α-rhamnopyranosyl-(1-2)]-[β-glucopyranosyl-(1-6)]-β-D-galactopyranoside, quercetin-3-O-[α-rhamnopyranosyl-(1-4)-α-rhamnopyranosyl-(1-6)-β-galactopyranoside], quercetin-3-O-α-L-rhamnopyranosyl-(1-2)-β-D-galactopyranoside, quercetin-3-O-β-D-diglucopyranoside, quercetin-3-O-β-D-galactoside-2''-gallate, quercetin-3-O-β-D-glucopyranoside-(1-6)-β-D-galactopyranoside, quercetin-3-O-β-D-glucopyranosyl-(1-3)-α-L-rhamnopyranosyl-(1-6)-β-D-galactopyranoside, quercetin-3-O-β-D-glucuronide, quercetin-3-O-β-D-xylopyranoside, quercetin-3-O-diglucospyranoside, quercetin-3-O-gentiobioside, quercetin-3-O-glucopyranosylgalactopyranoside, quercetin-3-O-neohesperidoside, quercetin-3-gentiotrioside, quercetin-3-methyl ether, quercetin-3-rhamnogentiobioside, quercetin-3-rhamnoglucoside and quercetin-3-sulfate.

**Claim 28 (New)** The method of Claim 26, wherein said at least one quercetin derivative is selected from the group consisting of isorhamnetin, quercimeritrin, rhamnetin, quercetin-5-O-β-D-glucopyranoside, quercetin-7-O-β-D-glucuronopyranoside and spireaoside.

**Claim 29 (New)** The method of Claim 26, wherein said at least one quercetin derivative is selected from the group consisting of rhamnazin, quercetin-3',4'-di-methyl ether, quercetin-3,3'-dimethyl ether, quercetin-3,7-dimethyl ether, quercetin-3-O-[2''-O-(6'''-O-p-coumaroyl)-β-D-glucopyranosyl]-α-L-rhamnopyranosyl-7-O-β-D-glucopyranoside, quercetin-3-O-[2''-O-6'''-O-p-(7'''-O-β-D-glucopyranosyl)coumaroyl-β-D-glucopyranosyl]-α-L-rhamnopyranoside-7-O-β-D-glucopyranoside, quercetin-3-O-rutinoside-7-O-β-D-glucopyranoside, quercetin-3-O-α-L-arabinopyranosyl-7-O-β-D-glucopyranoside, quercetin-7-O-β-D-glucopyranoside-3-O-sophoroside, quercetin-3-O-galactopyranosyl-7-O-diglucopyranoside,

**Appl. No.** : 10/070,047  
**Filed** : February 22, 2002

quercetin-3-O-glucopyranosyl-7-diglucopyranoside, quercetin-3,7-diglucopyranoside, quercetin-3-gentiobiosyl-7-glucopyranoside and quercetin-3,4'-di-O- $\beta$ -D-glucopyranoside.

**Claim 30 (New)** The method of Claim 26, wherein said at least one quercetin derivative is selected from the group consisting of quercetin-3,4',7-trimethyl ether and quercetin-3,3',4',7-tetramethyl ether.